

M67001.AR.006975
MCB CAMP LEJEUNE
5090.3a

VALIDATED DATA PACKAGE, A503688, MCB CAMP LEJEUNE NC
9/4/2015
ENVIRONMENTAL DATA SERVICES

**DATA VALIDATION SUMMARY REPORT
MCB CAMP LEJEUNE, NORTH CAROLINA**

Client: CH2M HILL, Inc., Virginia Beach, Virginia
SDG: A503688
Laboratory: Environmental Conservation Laboratories, Inc., Orlando, Florida
Site: MCB Camp Lejeune, LTM FY2015 Q3, Site 69, CTO-WE86
Date: September 4, 2015

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	IR69-GW09-15B	A503688-01	Water
2	IR69-GW09IW-15B	A503688-02	Water
3	IR69-GW09IWD-15B	A503688-03	Water
4	IR69-GW11-15B	A503688-04	Water
5	IR69-GW11IW-15B	A503688-05	Water
6	IR69-GW11DW-15B	A503688-06	Water
7	IR69-GW11DD-15B	A503688-07	Water
8	IR69-GW12-15B	A503688-08	Water
9	IR69-GW13IW-15B	A503688-09	Water
10	IR69-GW13DW-15B	A503688-10	Water
11	IR69-GW14-15B	A503688-11	Water
12	IR69-GW14DW-15B	A503688-12	Water
13	IR69-GW14DWD-15B	A503688-13	Water
14	IR69-GW30IW-15B	A503688-14	Water
15	IR69-EB-061515	A503688-15	Water

A full data validation was performed on the analytical data for fourteen water samples and one aqueous equipment blank sample collected on June 11 and 15, 2015 by CH2M HILL at MCB Camp Lejeune in North Carolina. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

Pesticides
PCBs

Method References

USEPA SW-846 Methods 8081B
USEPA SW-846 Methods 8082A

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods, the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," June 2008;
- and the reviewer's professional judgment.

The following items/criteria were reviewed for this report:

Organics

- Holding times and sample preservation
- Initial and continuing calibration summaries
- Method blank and field blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample (LCS) recoveries
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision
- GC Column Difference

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Overall Usability Issues:

There were no rejections of data.

Overall the data is acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedences of QC criteria.

Pesticides

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days for all samples.

Initial Calibration

- All %RSD and/or correlation coefficient criteria were met.

Continuing Calibration

- All %D criteria were met.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
IR69-EB-061515	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values except the following.

Sample ID	Surrogate	%R	Qualifier
3	TCMX/DCB1	125%/OK	None - Sample ND

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- A MS/MSD sample was not collected.

Laboratory Control Samples

- The LCS sample exhibited acceptable %R values.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples are analyzed below.

Pesticides				
Compound	IR69-GW09IW-15B ug/L	IR69-GW09IWD-15B ug/L	RPD	Qualifier
None	ND	ND	-	-

Pesticides				
Compound	IR69-GW14DW-15B ug/L	IR69-GW14DWD-15B ug/L	RPD	Qualifier
None	ND	ND	-	-

GC Column Difference

- All %D criteria were met.

Polychlorinated Biphenyls (PCBs)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days for all samples.

Initial Calibration

- All %RSD and/or correlation coefficient criteria were met.

Continuing Calibration

- All %D criteria were met.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
IR69-EB-061515	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- A MS/MSD sample was not collected.

Laboratory Control Samples

- The LCS sample exhibited acceptable %R values.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples are analyzed below.

PCBs				
Compound	IR69-GW09IW-15B ug/L	IR69-GW09IWD-15B ug/L	RPD	Qualifier
None	ND	ND	-	-

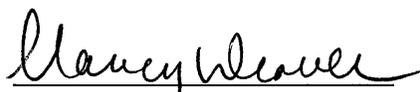
PCBs				
Compound	IR69-GW14DW-15B ug/L	IR69-GW14DWD-15B ug/L	RPD	Qualifier
None	ND	ND	-	-

GC Column Difference

- All %D criteria were met.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:



Nancy Weaver
Senior Chemist

Dated:

9/9/15

Data Qualifiers

- U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method.
- UJ = The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.
- J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL).
- J+ = The result is an estimated quantity, but the result may be biased high.
- J- = The result is an estimated quantity, but the result may be biased low.
- R = The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
- NJ = The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

ORGANIC ANALYSIS DATA SHEET

IR69-GW09-15B

EPA 8081B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-01 File ID: 2G2020.D
 Sampled: 06/11/15 12:30 Prepared: 06/17/15 18:27 Analyzed: 07/02/15 11:30
 Solids: Preparation: EPA 3510C Initial/Final: 101 mL / 1 mL
 Batch: 5F17056 Sequence: AA34631 Calibration: 1505052 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U Q	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.990	0.89	90	44 - 124	
Decachlorobiphenyl	0.990	1.1	109	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1118900000	5.355	1.2131E+09	5.589	

* Values outside of QC limits

mw 9/4/15

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ORGANIC ANALYSIS DATA SHEET

EPA 8081B

IR69-GW09IW-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-02 File ID: 2G2021.D
 Sampled: 06/11/15 14:00 Prepared: 06/17/15 18:27 Analyzed: 07/02/15 11:41
 Solids: Preparation: EPA 3510C Initial/Final: 100 mL / 1 mL
 Batch: 5F17056 Sequence: AA34631 Calibration: 1505052 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U Q	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.87	87	44 - 124	
Decachlorobiphenyl	1.00	0.81	81	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1227600000	5.357	1.2131E+09	5.589	

* Values outside of QC limits

mw 9/4/15

ORGANIC ANALYSIS DATA SHEET

IR69-GW09IWD-15B

EPA 8081B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-03 File ID: 2G2022.D
 Sampled: 06/11/15 14:05 Prepared: 06/17/15 18:27 Analyzed: 07/02/15 11:53
 Solids: Preparation: EPA 3510C Initial/Final: 100 mL / 1 mL
 Batch: 5F17056 Sequence: AA34631 Calibration: 1505052 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U Q	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	1.2	125	44 - 124	*
Decachlorobiphenyl	1.00	1.0	102	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1081100000	5.358	1.2131E+09	5.589	

* Values outside of QC limits

aw 9/4/15

ORGANIC ANALYSIS DATA SHEET
EPA 8081B

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IR69-GW11-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-04 File ID: 2G2023.D
 Sampled: 06/11/15 11:35 Prepared: 06/17/15 18:27 Analyzed: 07/02/15 12:04
 Solids: Preparation: EPA 3510C Initial/Final: 100 mL / 1 mL
 Batch: 5F17056 Sequence: AA34631 Calibration: 1505052 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	1.1	106	44 - 124	
Decachlorobiphenyl	1.00	0.84	84	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1123400000	5.351	1.2131E+09	5.589	

* Values outside of QC limits

NW 9/4/15

ORGANIC ANALYSIS DATA SHEET
EPA 8081B

IR69-GW11IW-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-05 File ID: 2G2024.D
 Sampled: 06/11/15 14:50 Prepared: 06/17/15 18:27 Analyzed: 07/02/15 12:15
 Solids: Preparation: EPA 3510C Initial/Final: 101 mL / 1 mL
 Batch: 5F17056 Sequence: AA34631 Calibration: 1505052 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U Q	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.990	0.80	81	44 - 124	
Decachlorobiphenyl	0.990	0.52	53	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1215400000	5.351	1.2131E+09	5.589	

* Values outside of QC limits

mw 9/4/15

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ORGANIC ANALYSIS DATA SHEET

EPA 8081B

IR69-GW11DW-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-06 File ID: 2G2025.D
 Sampled: 06/11/15 13:15 Prepared: 06/17/15 18:27 Analyzed: 07/02/15 12:27
 Solids: Preparation: EPA 3510C Initial/Final: 101 mL / 1 mL
 Batch: 5F17056 Sequence: AA34631 Calibration: 1505052 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U ϕ	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.990	0.82	83	44 - 124	
Decachlorobiphenyl	0.990	1.0	103	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1194000000	5.35	1.2131E+09	5.589	

* Values outside of QC limits

mw 9/15

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ORGANIC ANALYSIS DATA SHEET

EPA 8081B

IR69-GW11DD-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-07 File ID: 2G2026.D
 Sampled: 06/11/15 15:50 Prepared: 06/17/15 18:27 Analyzed: 07/02/15 12:38
 Solids: Preparation: EPA 3510C Initial/Final: 100 mL / 1 mL
 Batch: 5F17056 Sequence: AA34631 Calibration: 1505052 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U Q	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.87	87	44 - 124	
Decachlorobiphenyl	1.00	0.59	59	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1251700000	5.358	1.2131E+09	5.589	

* Values outside of QC limits

mw 9/4/15

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ORGANIC ANALYSIS DATA SHEET

IR69-GW12-15B

EPA 8081B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-08 File ID: 2GB019.D
 Sampled: 06/11/15 11:10 Prepared: 06/17/15 18:27 Analyzed: 07/07/15 12:43
 Solids: Preparation: EPA 3510C Initial/Final: 99 mL / 1 mL
 Batch: 5F17056 Sequence: AA34675 Calibration: 1507022 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.01	0.61	60	44 - 124	
Decachlorobiphenyl	1.01	0.45	45	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1555500000	5.333	1.4771E+09	5.327	

* Values outside of QC limits

W 9/14/15

ORGANIC ANALYSIS DATA SHEET
EPA 8081B

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IR69-GW13IW-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-09 File ID: 2G2028.D
 Sampled: 06/11/15 15:25 Prepared: 06/17/15 18:27 Analyzed: 07/02/15 13:01
 Solids: Preparation: EPA 3510C Initial/Final: 101 mL / 1 mL
 Batch: 5F17056 Sequence: AA34631 Calibration: 1505052 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U Q	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.990	0.84	85	44 - 124	
Decachlorobiphenyl	0.990	0.60	61	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1389700000	5.358	1.2131E+09	5.589	

* Values outside of QC limits

NW 9/4/15

ORGANIC ANALYSIS DATA SHEET
EPA 8081B

IR69-GW13DW-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-10 File ID: 2G2029.D
 Sampled: 06/11/15 14:00 Prepared: 06/17/15 18:27 Analyzed: 07/02/15 13:12
 Solids: Preparation: EPA 3510C Initial/Final: 100 mL / 1 mL
 Batch: 5F17056 Sequence: AA34631 Calibration: 1505052 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U Q	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	1.0	103	44 - 124	
Decachlorobiphenyl	1.00	0.75	75	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1225600000	5.35	1.2131E+09	5.589	

* Values outside of QC limits

NW 9/4/15

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ORGANIC ANALYSIS DATA SHEET
EPA 8081B

IR69-GW14-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
Matrix: Ground Water Laboratory ID: A503688-11 File ID: 2G2030.D
Sampled: 06/11/15 13:40 Prepared: 06/17/15 18:27 Analyzed: 07/02/15 13:24
Solids: Preparation: EPA 3510C Initial/Final: 101 mL / 1 mL
Batch: 5F17056 Sequence: AA34631 Calibration: 1505052 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U _Q	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.990	0.82	83	44 - 124	
Decachlorobiphenyl	0.990	0.57	58	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1354600000	5.35	1.2131E+09	5.589	

* Values outside of QC limits

NW 9/4/15

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ORGANIC ANALYSIS DATA SHEET

EPA 8081B

IR69-GW14DW-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-12 File ID: 2G2031.D
 Sampled: 06/11/15 11:15 Prepared: 06/17/15 18:27 Analyzed: 07/02/15 13:35
 Solids: Preparation: EPA 3510C Initial/Final: 99 mL / 1 mL
 Batch: 5F17056 Sequence: AA34631 Calibration: 1505052 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U Q	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.01	0.85	84	44 - 124	
Decachlorobiphenyl	1.01	0.49	49	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1335700000	5.351	1.2131E+09	5.589	

* Values outside of QC limits

mw 9/4/15

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

IR69-GW14DWD-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-13 File ID: 2G2032.D
 Sampled: 06/11/15 11:20 Prepared: 06/17/15 18:27 Analyzed: 07/02/15 13:47
 Solids: Preparation: EPA 3510C Initial/Final: 99 mL / 1 mL
 Batch: 5F17056 Sequence: AA34631 Calibration: 1505052 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U Q	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.01	0.89	88	44 - 124	
Decachlorobiphenyl	1.01	0.60	59	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1313400000	5.351	1.2131E+09	5.589	

* Values outside of QC limits

mw 9/4/15

14

ORGANIC ANALYSIS DATA SHEET
EPA 8081B

IR69-GW30IW-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-14 File ID: 2G2033.D
 Sampled: 06/11/15 15:50 Prepared: 06/17/15 18:27 Analyzed: 07/02/15 13:58
 Solids: Preparation: EPA 3510C Initial/Final: 100 mL / 1 mL
 Batch: 5F17056 Sequence: AA34631 Calibration: 1505052 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.80	80	44 - 124	
Decachlorobiphenyl	1.00	0.78	78	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1421800000	5.352	1.2131E+09	5.589	

* Values outside of QC limits

aw 9/4/15

15

ORGANIC ANALYSIS DATA SHEET
EPA 8081B

IR69-EB-061515

Laboratory: ENCO Orlando	SDG: A503688-CTO-WE86		
Client: CH2M Hill, Inc. (CH025)	Project: CTO-WE86 MCB Camp Lejeune Site 69		
Matrix: Water	Laboratory ID: A503688-15	File ID: 2G2034.D	
Sampled: 06/15/15 07:50	Prepared: 06/17/15 18:27	Analyzed: 07/02/15 14:09	
Solids:	Preparation: EPA 3510C	Initial/Final: 100 mL / 1 mL	
Batch: 5F17056	Sequence: AA34631	Calibration: 1505052	Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U Q	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.98	98	44 - 124	
Decachlorobiphenyl	1.00	0.55	55	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1325300000	5.359	1.2131E+09	5.589	

* Values outside of QC limits

Mr 9/14/15

ORGANIC ANALYSIS DATA SHEET

EPA 8082A

IR69-GW09-15B

Laboratory:	<u>ENCO Orlando</u>	SDG:	<u>A503688-CTO-WE86</u>
Client:	<u>CH2M Hill, Inc. (CH025)</u>	Project:	<u>CTO-WE86 MCB Camp Lejeune Site 69</u>
Matrix:	<u>Ground Water</u>	Laboratory ID:	<u>A503688-01</u>
		File ID:	<u>2FM068.D</u>
Sampled:	<u>06/11/15 12:30</u>	Prepared:	<u>06/17/15 18:27</u>
		Analyzed:	<u>06/18/15 21:28</u>
Solids:		Preparation:	<u>EPA 3510C</u>
		Initial/Final:	<u>101 mL / 1 mL</u>
Batch:	<u>5F17057</u>	Sequence:	<u>AA34421</u>
		Calibration:	<u>1506046</u>
		Instrument:	<u>OSVGCECD2</u>

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.990	0.59	60	38 - 142	
Decachlorobiphenyl	0.990	0.73	74	40 - 135	

* Values outside of QC limits

ms 9/4/15

2

ORGANIC ANALYSIS DATA SHEET

EPA 8082A

IR69-GW09IW-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-02 File ID: 2FM069.D
 Sampled: 06/11/15 14:00 Prepared: 06/17/15 18:27 Analyzed: 06/18/15 21:39
 Solids: Preparation: EPA 3510C Initial/Final: 100 mL / 1 mL
 Batch: 5F17057 Sequence: AA34421 Calibration: 1506046 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.65	65	38 - 142	
Decachlorobiphenyl	1.00	0.61	61	40 - 135	

* Values outside of QC limits

Nov 9/14/15

3

ORGANIC ANALYSIS DATA SHEET

EPA 8082A

IR69-GW09IWD-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-03 File ID: 2FM070.D
 Sampled: 06/11/15 14:05 Prepared: 06/17/15 18:27 Analyzed: 06/18/15 21:51
 Solids: Preparation: EPA 3510C Initial/Final: 100 mL / 1 mL
 Batch: 5F17057 Sequence: AA34421 Calibration: 1506046 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.75	75	38 - 142	
Decachlorobiphenyl	1.00	0.74	74	40 - 135	

* Values outside of QC limits

NW 9/14/15

4

ORGANIC ANALYSIS DATA SHEET

IR69-GW11-15B

EPA 8082A

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-04 File ID: 2FM071.D
 Sampled: 06/11/15 11:35 Prepared: 06/17/15 18:27 Analyzed: 06/18/15 22:02
 Solids: Preparation: EPA 3510C Initial/Final: 100 mL / 1 mL
 Batch: 5F17057 Sequence: AA34421 Calibration: 1506046 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.71	71	38 - 142	
Decachlorobiphenyl	1.00	0.66	66	40 - 135	

* Values outside of QC limits

new 9/4/15

ORGANIC ANALYSIS DATA SHEET

EPA 8082A

6
IR69-GW11DW-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
Matrix: Ground Water Laboratory ID: A503688-06 File ID: 2FM073.D
Sampled: 06/11/15 13:15 Prepared: 06/17/15 18:27 Analyzed: 06/18/15 22:25
Solids: Preparation: EPA 3510C Initial/Final: 101 mL / 1 mL
Batch: 5F17057 Sequence: AA34421 Calibration: 1506046 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.990	0.60	61	38 - 142	
Decachlorobiphenyl	0.990	0.76	77	40 - 135	

* Values outside of QC limits

MW 9/4/15

ORGANIC ANALYSIS DATA SHEET
EPA 8082A

7
IR69-GW11DD-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-07 File ID: 2FM074.D
 Sampled: 06/11/15 15:50 Prepared: 06/17/15 18:27 Analyzed: 06/18/15 22:36
 Solids: Preparation: EPA 3510C Initial/Final: 100 mL / 1 mL
 Batch: 5F17057 Sequence: AA34421 Calibration: 1506046 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.64	64	38 - 142	
Decachlorobiphenyl	1.00	0.52	52	40 - 135	

* Values outside of QC limits

nw 9/4/15

ORGANIC ANALYSIS DATA SHEET

IR69-GW12-15B

EPA 8082A

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-08 File ID: 2FM077.D
 Sampled: 06/11/15 11:10 Prepared: 06/17/15 18:27 Analyzed: 06/18/15 23:10
 Solids: Preparation: EPA 3510C Initial/Final: 99 mL / 1 mL
 Batch: 5F17057 Sequence: AA34421 Calibration: 1506046 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.01	0.62	61	38 - 142	
Decachlorobiphenyl	1.01	0.45	45	40 - 135	

* Values outside of QC limits

NW 9/14/15

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ORGANIC ANALYSIS DATA SHEET

IR69-GW13IW-15B

EPA 8082A

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-09 File ID: 2FM078.D
 Sampled: 06/11/15 15:25 Prepared: 06/17/15 18:27 Analyzed: 06/18/15 23:21
 Solids: Preparation: EPA 3510C Initial/Final: 101 mL / 1 mL
 Batch: 5F17057 Sequence: AA34421 Calibration: 1506046 Instrument: OSVGECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.990	0.69	70	38 - 142	
Decachlorobiphenyl	0.990	0.57	58	40 - 135	

* Values outside of QC limits

NW 9/4/15

ORGANIC ANALYSIS DATA SHEET

EPA 8082A

IR69-GW13DW-15B

Laboratory:	<u>ENCO Orlando</u>	SDG:	<u>A503688-CTO-WE86</u>
Client:	<u>CH2M Hill, Inc. (CH025)</u>	Project:	<u>CTO-WE86 MCB Camp Lejeune Site 69</u>
Matrix:	<u>Ground Water</u>	Laboratory ID:	<u>A503688-10</u>
		File ID:	<u>2FM079.D</u>
Sampled:	<u>06/11/15 14:00</u>	Prepared:	<u>06/17/15 18:27</u>
		Analyzed:	<u>06/18/15 23:33</u>
Solids:		Preparation:	<u>EPA 3510C</u>
		Initial/Final:	<u>100 mL / 1 mL</u>
Batch:	<u>5F17057</u>	Sequence:	<u>AA34421</u>
		Calibration:	<u>1506046</u>
		Instrument:	<u>OSVGCECD2</u>

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.76	76	38 - 142	
Decachlorobiphenyl	1.00	0.54	54	40 - 135	

* Values outside of QC limits

NW 9/4/15

ORGANIC ANALYSIS DATA SHEET

EPA 8082A

IR69-GW14-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-11 File ID: 2FM080.D
 Sampled: 06/11/15 13:40 Prepared: 06/17/15 18:27 Analyzed: 06/18/15 23:44
 Solids: Preparation: EPA 3510C Initial/Final: 101 mL / 1 mL
 Batch: 5F17057 Sequence: AA34421 Calibration: 1506046 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.990	0.70	71	38 - 142	
Decachlorobiphenyl	0.990	0.53	54	40 - 135	

* Values outside of QC limits

aw 9/14/15

12

ORGANIC ANALYSIS DATA SHEET

EPA 8082A

IR69-GW14DW-15B

Laboratory:	<u>ENCO Orlando</u>	SDG:	<u>A503688-CTO-WE86</u>
Client:	<u>CH2M Hill, Inc. (CH025)</u>	Project:	<u>CTO-WE86 MCB Camp Lejeune Site 69</u>
Matrix:	<u>Ground Water</u>	Laboratory ID:	<u>A503688-12</u>
		File ID:	<u>2FM081.D</u>
Sampled:	<u>06/11/15 11:15</u>	Prepared:	<u>06/17/15 18:27</u>
		Analyzed:	<u>06/18/15 23:56</u>
Solids:		Preparation:	<u>EPA 3510C</u>
		Initial/Final:	<u>99 mL / 1 mL</u>
Batch:	<u>5F17057</u>	Sequence:	<u>AA34421</u>
		Calibration:	<u>1506046</u>
		Instrument:	<u>OSVGECD2</u>

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.01	0.66	65	38 - 142	
Decachlorobiphenyl	1.01	0.46	46	40 - 135	

* Values outside of QC limits

nw 9/14/15

13

ORGANIC ANALYSIS DATA SHEET

IR69-GW14DWD-15B

EPA 8082A

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-13 File ID: 2FM082.D
 Sampled: 06/11/15 11:20 Prepared: 06/17/15 18:27 Analyzed: 06/19/15 00:07
 Solids: Preparation: EPA 3510C Initial/Final: 99 mL / 1 mL
 Batch: 5F17057 Sequence: AA34421 Calibration: 1506046 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.01	0.70	69	38 - 142	
Decachlorobiphenyl	1.01	0.53	52	40 - 135	

* Values outside of QC limits

NW 9/4/15

ORGANIC ANALYSIS DATA SHEET

EPA 8082A

IR69-GW30IW-15B

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Ground Water Laboratory ID: A503688-14 File ID: 2FM083.D
 Sampled: 06/11/15 15:50 Prepared: 06/17/15 18:27 Analyzed: 06/19/15 00:18
 Solids: Preparation: EPA 3510C Initial/Final: 100 mL / 1 mL
 Batch: 5F17057 Sequence: AA34421 Calibration: 1506046 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.68	68	38 - 142	
Decachlorobiphenyl	1.00	0.73	73	40 - 135	

* Values outside of QC limits

MW 9/4/15

ORGANIC ANALYSIS DATA SHEET
EPA 8082A

IR69-EB-061515

Laboratory: ENCO Orlando SDG: A503688-CTO-WE86
 Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69
 Matrix: Water Laboratory ID: A503688-15 File ID: 2FM084.D
 Sampled: 06/15/15 07:50 Prepared: 06/17/15 18:27 Analyzed: 06/19/15 00:30
 Solids: Preparation: EPA 3510C Initial/Final: 100 mL / 1 mL
 Batch: 5F17057 Sequence: AA34421 Calibration: 1506046 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.72	72	38 - 142	
Decachlorobiphenyl	1.00	0.45	45	40 - 135	

* Values outside of QC limits

rw 9/4/15

**DATA VALIDATION SUMMARY REPORT
MCB CAMP LEJEUNE, NORTH CAROLINA**

Client: CH2M HILL, Inc., Virginia Beach, Virginia
 SDG: A503688
 Laboratory: Environmental Conservation Laboratories, Inc., Orlando, Florida
 Site: MCB Camp Lejeune, LTM FY2015 Q3, Site 69, CTO-WE86
 Date: September 3, 2015

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	IR69-GW09IW-15B	A503688-02	Water
2	IR69-GW09IWD-15B	A503688-03	Water
3	IR69-GW11IW-15B	A503688-05	Water
4	IR69-GW11DW-15B	A503688-06	Water
5	IR69-GW11DD-15B	A503688-07	Water
6	IR69-GW13IW-15B	A503688-09	Water
7	IR69-GW13DW-15B	A503688-10	Water
8	IR69-GW14-15B	A503688-11	Water
9	IR69-GW14DW-15B	A503688-12	Water
10	IR69-GW14DWD-15B	A503688-13	Water
11	IR69-GW30IW-15B	A503688-14	Water
12	IR69-EB-061515	A503688-15	Water

A full data validation was performed on the analytical data for eleven water samples and one aqueous equipment blank sample collected on June 11 and 15, 2015 by CH2M HILL at MCB Camp Lejeune in North Carolina. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

Metals (Cr/Tl)

Method References

USEPA SW-846 Methods 6020A

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods, the USEPA National Functional Guidelines for Inorganic Data Review as follows:

- The USEPA "Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review," January 2010;
- and the reviewer's professional judgment.

The following items/criteria were reviewed for this report:

Inorganics

- Holding times and sample preservation
- ICP/MS Tuning
- Initial and continuing calibration verifications
- Method blank and field blank contamination
- ICP Interference Check Sample
- Laboratory Control Sample (LCS) recoveries
- Matrix Spike Analysis
- Duplicate Sample Analysis
- ICP Serial Dilution
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Overall Usability Issues:

There were no rejections of data.

Overall the data is acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedences of QC criteria.

Metals (Chromium/Thallium)

Holding Times

- All samples were prepared and analyzed within 180 days for all metals.

Initial Calibration Verification

- All initial calibration criteria were met.

Continuing Calibration Verification

- All continuing calibration criteria were met.

Method Blank

- The method blanks were free of contamination.

Field Blank

- The field QC samples exhibited the following contamination.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
IR69-EB-061515	None - ND	-	-	-

ICP Interference Check Sample

- The ICP interference check sample exhibited acceptable %R values.

Laboratory Control Samples

- The LCS sample exhibited acceptable recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- A MS/MSD sample was not collected.

ICP Serial Dilution

- ICP serial dilution percent differences (%D) were acceptable.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below.

Compound	Metals		RPD	Qualifier
	IR69-GW09IW-15B ug/L	IR69-GW09IWD-15B ug/L		
None	ND	ND	-	-

Metals				
Compound	IR69-GW14DW-15B ug/L	IR69-GW14DWD-15B ug/L	RPD	Qualifier
None	ND	ND	-	-

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: *Nancy Weaver*
 Nancy Weaver
 Senior Chemist

Dated: 9/9/15

Data Qualifiers

- U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method.
- UJ = The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.
- J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL).
- J+ = The result is an estimated quantity, but the result may be biased high.
- J- = The result is an estimated quantity, but the result may be biased low.
- R = The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
- NJ = The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

INORGANIC ANALYSIS DATA SHEET
EPA 6020A

1
IR69-GW091W-15B

Laboratory: ENCO Orlando

SDG: A503688-CTO-WE86

Client: CH2M Hill, Inc. (CH025)

Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water

Laboratory ID: A503688-02

File ID: 061815_RP1_DOD-044

Sampled: 06/11/15 14:00

Prepared: 06/18/15 06:51

Analyzed: 06/18/15 11:11

Solids: 0.00

Preparation: EPA 3005A

Initial/Final: 50 mL / 50 mL

Batch: SF17042

Sequence: AA34395

Calibration: 1506063

Instrument: OMICPMS1

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	DL	LOD	LOQ	Method
7440-47-3	Chromium	<3.00	1	U	0.450	3.00	5.00	EPA 6020A
7440-28-0	Thallium	<0.230	1	U	0.0580	0.230	0.400	EPA 6020A

new 9/4/15

INORGANIC ANALYSIS DATA SHEET

EPA 6020A

2
IR69-GW09IWD-15B

Laboratory: ENCO Orlando

SDG: A503688-CTO-WE86

Client: CH2M Hill, Inc. (CH025)

Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water

Laboratory ID: A503688-03

File ID: 061815_RP1_DOD-051

Sampled: 06/11/15 14:05

Prepared: 06/18/15 06:51

Analyzed: 06/18/15 11:41

Solids: 0.00

Preparation: EPA 3005A

Initial/Final: 50 mL / 50 mL

Batch: 5F17042

Sequence: AA34395

Calibration: 1506063

Instrument: OMICPMS1

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	DL	LOD	LOQ	Method
7440-47-3	Chromium	<3.00	1	U	0.450	3.00	5.00	EPA 6020A
7440-28-0	Thallium	<0.230	1	U	0.0580	0.230	0.400	EPA 6020A

mw 9/4/15

INORGANIC ANALYSIS DATA SHEET
EPA 6020A

3
 IR69-GW111W-15B

Laboratory: ENCO Orlando

SDG: A503688-CTO-WE86

Client: CH2M Hill, Inc. (CH025)

Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water

Laboratory ID: A503688-05

File ID: 061815_RP1_DOD-067

Sampled: 06/11/15 14:50

Prepared: 06/18/15 06:51

Analyzed: 06/18/15 12:53

Solids: 0.00

Preparation: EPA 3005A

Initial/Final: 50 mL / 50 mL

Batch: SF17042

Sequence: AA34395

Calibration: 1506063

Instrument: OMICPMS1

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	DL	LOD	LOQ	Method
7440-47-3	Chromium	<3.00	1	U	0.450	3.00	5.00	EPA 6020A
7439-89-6	Iron	7450	1	E	3.80	15.0	25.0	EPA 6020A
7440-28-0	Thallium	<0.230	1	U	0.0580	0.230	0.400	EPA 6020A

nw 9/14/15

INORGANIC ANALYSIS DATA SHEET

EPA 6020A

4
IR69-GW11DW-15B

Laboratory: ENCO Orlando

SDG: A503688-CTO-WE86

Client: CH2M Hill, Inc. (CH025)

Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water

Laboratory ID: A503688-06

File ID: 061815_RP1_DOD-041

Sampled: 06/11/15 13:15

Prepared: 06/18/15 06:51

Analyzed: 06/18/15 11:01

Solids: 0.00

Preparation: EPA 3005A

Initial/Final: 50 mL / 50 mL

Batch: 5F17042

Sequence: AA34395

Calibration: 1506063

Instrument: OMICPMS1

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	DL	LOD	LOQ	Method
7440-47-3	Chromium	<3.00	1	U	0.450	3.00	5.00	EPA 6020A
7439-89-6	Iron	318	1		3.80	15.0	25.0	EPA 6020A
7440-28-0	Thallium	<0.230	1	U	0.0580	0.230	0.400	EPA 6020A

nw 9/4/15

INORGANIC ANALYSIS DATA SHEET

EPA 6020A

5
IR69-GW11DD-15B

Laboratory: ENCO Orlando

SDG: A503688-CTO-WE86

Client: CH2M Hill, Inc. (CH025)

Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water

Laboratory ID: A503688-07

File ID: 061815_RP1_DOD-068

Sampled: 06/11/15 15:50

Prepared: 06/18/15 06:51

Analyzed: 06/18/15 13:02

Solids: 0.00

Preparation: EPA 3005A

Initial/Final: 50 mL / 50 mL

Batch: 5F17042

Sequence:

AA34395

Calibration: 1506063

Instrument: OMICPMS1

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	DL	LOD	LOQ	Method
7440-47-3	Chromium	0.522	1	J	0.450	3.00	5.00	EPA 6020A
7440-28-0	Thallium	<0.230	1	U	0.0580	0.230	0.400	EPA 6020A

AW 9/4/15

INORGANIC ANALYSIS DATA SHEET
EPA 6020A

6
IR69-GW13IW-15B

Laboratory: ENCO Orlando

SDG: A503688-CTO-WE86

Client: CH2M Hill, Inc. (CH025)

Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water

Laboratory ID: A503688-09

File ID: 061815_RP1_DOD-055

Sampled: 06/11/15 15:25

Prepared: 06/18/15 06:51

Analyzed: 06/18/15 11:54

Solids: 0.00

Preparation: EPA 3005A

Initial/Final: 50 mL / 50 mL

Batch: 5F17042

Sequence:

AA34395

Calibration: 1506063

Instrument: OMICPMS1

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	DL	LOD	LOQ	Method
7440-47-3	Chromium	<3.00	1	U	0.450	3.00	5.00	EPA 6020A
7439-89-6	Iron	3320	1	E	3.80	15.0	25.0	EPA 6020A
7440-28-0	Thallium	<0.230	1	U	0.0580	0.230	0.400	EPA 6020A

new 9/4/15

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INORGANIC ANALYSIS DATA SHEET

EPA 6020A

IR69-GW13DW-15B

Laboratory: ENCO Orlando

SDG: A503688-CTO-WE86

Client: CH2M Hill, Inc. (CH025)

Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water

Laboratory ID: A503688-10

File ID: 061815 RP1 DOD-053

Sampled: 06/11/15 14:00

Prepared: 06/18/15 06:51

Analyzed: 06/18/15 11:47

Solids: 0.00

Preparation: EPA 3005A

Initial/Final: 50 mL / 50 mL

Batch: 5F17042

Sequence:

AA34395

Calibration: 1506063

Instrument: OMICPMS1

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	DL	LOD	LOQ	Method
7440-47-3	Chromium	1.64	1	J	0.450	3.00	5.00	EPA 6020A
7439-89-6	Iron	1710	1	E	3.80	15.0	25.0	EPA 6020A
7440-28-0	Thallium	<0.230	1	U	0.0580	0.230	0.400	EPA 6020A

aw 9/14/15

INORGANIC ANALYSIS DATA SHEET

EPA 6020A

IR69-GW14-15B

Laboratory: ENCO Orlando

SDG: A503688-CTO-WE86

Client: CH2M Hill, Inc. (CH025)

Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water

Laboratory ID: A503688-11

File ID: 061815 RP1_DOD-049

Sampled: 06/11/15 13:40

Prepared: 06/18/15 06:51

Analyzed: 06/18/15 11:35

Solids: 0.00

Preparation: EPA 3005A

Initial/Final: 50 mL / 50 mL

Batch: 5F17042

Sequence: AA34395

Calibration: 1506063

Instrument: OMICPMS1

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	DL	LOD	LOQ	Method
7440-47-3	Chromium	<3.00	1	U	0.450	3.00	5.00	EPA 6020A
7439-89-6	Iron	1190	1	E	3.80	15.0	25.0	EPA 6020A
7440-28-0	Thallium	<0.230	1	U	0.0580	0.230	0.400	EPA 6020A

mw 9/4/15

INORGANIC ANALYSIS DATA SHEET
EPA 6020A

9
IR69-GW14DW-15B

Laboratory: ENCO Orlando

SDG: A503688-CTO-WE86

Client: CH2M Hill, Inc. (CH025)

Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water

Laboratory ID: A503688-12

File ID: 061815_RP1_DOD-059

Sampled: 06/11/15 11:15

Prepared: 06/18/15 06:51

Analyzed: 06/18/15 12:16

Solids: 0.00

Preparation: EPA 3005A

Initial/Final: 50 mL / 50 mL

Batch: 5F17042

Sequence:

AA34395

Calibration: 1506063

Instrument: OMICPMS1

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	DL	LOD	LOQ	Method
7440-47-3	Chromium	<3.00	1	U	0.450	3.00	5.00	EPA 6020A
7439-89-6	Iron	3480	1	E	3.80	15.0	25.0	EPA 6020A
7440-28-0	Thallium	<0.230	1	U	0.0580	0.230	0.400	EPA 6020A

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INORGANIC ANALYSIS DATA SHEET

EPA 6020A

IR69-GW14DWD-15B

Laboratory: ENCO Orlando

SDG: A503688-CTO-WE86

Client: CH2M Hill, Inc. (CH025)

Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water

Laboratory ID: A503688-13

File ID: 061815 RP1 DOD-061

Sampled: 06/11/15 11:20

Prepared: 06/18/15 06:51

Analyzed: 06/18/15 12:22

Solids: 0.00

Preparation: EPA 3005A

Initial/Final: 50 mL / 50 mL

Batch: 5F17042

Sequence: AA34395

Calibration: 1506063

Instrument: OMICPMS1

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	DL	LOD	LOQ	Method
7440-47-3	Chromium	<3.00	1	U	0.450	3.00	5.00	EPA 6020A
7440-28-0	Thallium	<0.230	1	U	0.0580	0.230	0.400	EPA 6020A

aw 9/4/15

INORGANIC ANALYSIS DATA SHEET
EPA 6020A

11
IR69-GW30IW-15B

Laboratory: ENCO Orlando

SDG: A503688-CTO-WE86

Client: CH2M Hill, Inc. (CH025)

Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water

Laboratory ID: A503688-14

File ID: 061815 RP1_DOD-048

Sampled: 06/11/15 15:50

Prepared: 06/18/15 06:51

Analyzed: 06/18/15 11:32

Solids: 0.00

Preparation: EPA 3005A

Initial/Final: 50 mL / 50 mL

Batch: 5F17042

Sequence: AA34395

Calibration: 1506063

Instrument: OMICPMS1

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	DL	LOD	LOQ	Method
7440-47-3	Chromium	0.492	1	J	0.450	3.00	5.00	EPA 6020A
7440-28-0	Thallium	<0.230	1	U	0.0580	0.230	0.400	EPA 6020A

NW 9/14/15

INORGANIC ANALYSIS DATA SHEET
EPA 6020A

12
IR69-EB-061515

Laboratory: ENCO Orlando

SDG: A503688-CTO-WE86

Client: CH2M Hill, Inc. (CH025)

Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Water

Laboratory ID: A503688-15

File ID: 061815_RP1_DOD-038

Sampled: 06/15/15 07:50

Prepared: 06/18/15 06:51

Analyzed: 06/18/15 10:52

Solids: 0.00

Preparation: EPA 3005A

Initial/Final: 50 mL / 50 mL

Batch: 5F17042

Sequence: AA34395

Calibration: 1506063

Instrument: OMICPMS1

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	DL	LOD	LOQ	Method
7440-47-3	Chromium	<3.00	1	U	0.450	3.00	5.00	EPA 6020A
7439-89-6	Iron	8.96	1	J	3.80	15.0	25.0	EPA 6020A
7440-28-0	Thallium	<0.230	1	U	0.0580	0.230	0.400	EPA 6020A

NW 9/4/15